



## FEEDING THE MARE THROUGH PREGNANCY

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Previous thoughts on feeding mares through pregnancy placed most nutritional emphasis on the last phase of gestation. We now appreciate that critical organs, such as the heart, are developing during early and mid gestation and specific nutrients are critical for their development. Minerals such as copper and zinc and vitamins A and D are crucial for healthy development of internal organs (Ashworth and Antipatis, 2001). The consequences of specific micronutrient deficiencies can be more extreme and longer lasting than those occurring after general under-nutrition. Feeding rats ad libitum from mating with a zinc-deficient diet increased both the number of malformations per fetus and the number of resorptions per litter compared with animals that received a control diet (Masters *et al.*, 1983).

When considering the mare's diet and condition we must also be conscious of the affects these parameters have on fetal development. Alterations in fetal nutrition and endocrine status may result in developmental adaptations that permanently change the structure, physiology, and metabolism of the offspring, thereby predisposing them to metabolic, endocrine and physical disruptions later in life (Fowden and Forhead, 2004). Animal studies show that both maternal under-nutrition and over-nutrition reduce placental-fetal blood flows and stunt fetal growth (Wu *et al.*, 2004).

### ***Feeding Through Early & Mid Gestation***

From the time of conception through foaling, the fetus is actively growing. However, fetal growth is not occurring at a steady rate. During early and mid pregnancy the developing fetus is very small, less than 20% of birth weight. This represents less than 2% of the mare's body weight. The nutrient requirements of the mare during early pregnancy are very similar to the nutrient requirements of a non-pregnant mare. A common feeding mistake is to over feed mare's calories during early pregnancy causing them to become overweight. An all forage (hay or pasture) diet fed at a rate of 2 to 2.5% of body weight will provide most mares with adequate levels of both energy (calories) and protein, but is likely deficient in several key minerals including copper, zinc and selenium and may not be contain proper ratios of

calcium and phosphorus. To provide critical nutrients to a mare in early & mid pregnancy, without providing an overabundance of calories, a low-intake vitamin and mineral supplement pellet should be fed.

If the mare in early pregnancy is underweight or can't maintain body condition on an all-forage diet, increased caloric intake is required. This can be achieved by adding a higher energy commercial feed, or by adding a fat supplement such as vegetable oil or stabilized rice bran. Alfalfa or alfalfa mixed hay should also be incorporated as it is higher in calories than grass hay alone.

### ***Feeding Through Late Gestation***

During late pregnancy the fetus will gain approximately 80% of its birth weight. To support this rapid fetal growth, the mare's requirements for energy, protein, minerals and vitamins increase. The requirements for trace minerals are especially critical since the mare will fortify the unborn foal liver with minerals such as copper, zinc and selenium. Mare's milk is not a good source of these trace minerals therefore they must be stored in the foal's liver prior to birth (Gee, 2000). Without proper liver stores of trace minerals, the foal may be predisposed to growth disorders such as developmental orthopedic disease (Caure *et al.*, 1998). Compounded with an increased requirement for nutrients, the mare in late pregnancy has a limited capacity for feed intake due to the size of the fetus compressing the digestive system. To meet the nutrient needs of mares in late pregnancy, hay intake is often reduced and fortified grain is fed as a concentrated source of essential nutrients. In particular protein and energy requirements are higher. An 1100 lb mare increases her protein requirement from 630g per day at maintenance to 893g per day in the 11<sup>th</sup> month of pregnancy. Digestible energy requirements increase from 16.7 Mcal/day to 21.4 Mcal/day for the same mare (NRC, 2007). To properly feed these mares, good quality hay should be offered free choice and a grain concentrate designed specifically for broodmares fed according to manufacturer guidelines. It may be possible in certain instances for overweight or "easy keeping" mares to be fed a low intake protein, vitamin and mineral supplement pellet rather than a grain concentrate in an effort to reduce or control weight in late pregnancy.

## Specialized Feeds

For mares in early pregnancy that maintain their body weight well on hay and pasture, **Poulin Grain's EQUI-PRO<sup>®</sup> MVP** is a perfect choice as it will adequately fortify the diet without adding excess calories. **EQUI-PRO<sup>®</sup> MVP** is a low intake feed designed to be fed at approximately 1 lb/1000 lbs of Body Weight/day. **EQUI-PRO<sup>®</sup> MVP** can also be fed to easy keeping mares throughout their entire pregnancy (contact a Poulin Grain Representative for appropriate feeding rates).

Mares in late gestation should be fed **EQUI-PRO<sup>®</sup> Mare & Foal**. This is also an ideal choice for mares that require extra calories during early and mid gestation to maintain body condition. **EQUI-PRO<sup>®</sup> Mare & Foal** contains increased concentrations of Vitamin E and highly bioavailable organic selenium. Both **MVP** and **Mare & Foal** contain chelated trace minerals. Recent research showed that foals born to mares supplemented with chelated minerals throughout their entire pregnancy had increased immune function at birth and mares had higher colostrum immunoglobulins.

All the Poulin Grain feeds have been formulated specifically for East Coast feeding management strategies and conditions. **Poulin Grain's EQUI-PRO<sup>®</sup>** horse feeds are a premium line of feed balanced and formulated for the current stage of life of your horse. Formulated in these feeds, is research on growth, energy, digestion and absorption of nutrients. Included in the **EQUI-PRO<sup>®</sup>** line is live cell yeast that aids in digestion and chelated or organic minerals that increase the availability of minerals and provides increased stress and disease resistance. High levels of vitamin E and selenium are included for the immune system. **EQUI-PRO<sup>®</sup>** feeds are nutrient dense feeds that work with your horse's nutrient system to provide the maximum natural nutrition your horse needs.

### References:

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